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Arsenal Ship: The Operational Commander's Perspective

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Joint Military Operations Department.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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### Abstract of

#### ARSENAL SHIP: THE OPERATIONAL COMMANDER'S PERSPECTIVE

Much has been written concerning the fledgling arsenal ship concept espoused by former Chief of Naval Operations, ADM J.M. Boorda. To date that writing has centered around budgetary and strategic force planning issues. However, now is the time to consider the operational commander's perspective on opportunities and limitations in employment that this joint asset will bring to the theater.

The issue of command and control over the vast array of ordnance which arsenal ship brings to the war is likely to be unique in the development of joint operational doctrine. Technology will allow a remote shooter to determine targets, select ordnance and engage in battle without being onboard the launch platform. This will require coordination and the issue should be resolved before the theater CINC owns the asset.

Operational level doctrine to be addressed in the case of the arsenal ship also includes the functions of operational fires, operational logistics, and operational protection.

Clearly, arsenal ship represents a philosophical change in from any ship previously constructed. It is designed strictly for joint littoral operations, the embodiment of "From the Sea." As such, its capabilities and limitations make it a unique fit into the envisioned theaters of possible employment. Certainly, its use in one theater, the Persian Gulf, will not mirror employment in another, for example Korea. The time to consider its incorporation into operational planning is now.

## INTRODUCTION AND THESIS

Few topics of military conversations cause as much diverse opinion as the Navy's proposed arsenal ship program. For their own reasons the Navy wants to build it and the Army wants them to build it. The Marines are less enthusiastic<sup>1</sup> and the Air Force is outright opposed to it<sup>2</sup> because they view it as a threat to missions carried out to date by their own aviation components. Many in the Navy view it as the next battleship, especially some surface warfare specialists who consider it to be "their" new capital ship. For various reasons they too, are wrong. The Army and Marines view it as filling a longstanding void in naval gunfire/surface fire support (NGFS/NSFS). This is true, but the arsenal ship is much more than a tactical NSFS asset. Much has been written in various public media and professional journal articles, especially since then Chief of Naval Operations, ADM J.M. Boorda, stated his support for the idea<sup>3</sup>. However, these articles have centered on cost, tactical value and capability, and strategic force planning issues associated with the arsenal ship concept. Little has been written about what the arsenal ship will mean to the operational commander once this asset is his to employ in any number of varied situations. Issues and problems with the basic

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<sup>1</sup>"Arsenal Ship Raises Command, Budget Questions," BMD Monitor, 7 February 1997, No.3, Vol.12.

<sup>2</sup>Ibid.

<sup>3</sup>Larry Lynn, "Conversations with Larry Lynn," Aerospace America, February 1997, 14.

operational functions (C2, operational fires, logistics, operational protection and operational security) must be considered now if the true potential of the asset is to be realized when it is delivered in as little as four short years<sup>4</sup>. In the words of noted naval analyst, Norman Polmar, "It would be revolutionary. We haven't developed a new warship concept since big missile submarines 40 years ago. This could have as much impact on warfare."<sup>5</sup>

As background, one must consider what the arsenal ship is and what it isn't. Designed to support joint operations ashore arsenal ship holds little value as a purely naval asset in a principally naval operation. However, it is the essence of "...From the Sea" in that it will be the first naval ship to be conceived, designed and built solely to support joint operations, specifically in a littoral environment. As such, it supports the operational commander differently than other naval assets. It brings unique capabilities, employment options and vulnerabilities which the operational commander must plan for if he is to optimize the asset's value.

In essence, this truly joint platform must have employment doctrine which is also joint. This paper will discuss the arsenal ship from a joint operational perspective, addressing it in terms

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<sup>4</sup>"Arsenal Ship Takes Shape," Jane's Navy International, 1 June 1996, 47.

<sup>5</sup>"U.S. Arsenal Ship Could Revolutionize Naval Warfare," Periscope Daily Defense News Capsules, 12 July 1996.

of operational functions.

### COMMAND AND CONTROL

Without doubt, the greatest challenges in effective employment of the arsenal ship asset lay in the command and control arena. Beyond the technological challenges, which comprise many difficult but solvable dilemmas, are those of operational C2 doctrine.

The Joint Force Air Component Commander (JFACC), Joint Force Land Component Commander (JFLCC), Joint Force Air Defense Commander (JFADC) and the Joint Force Naval Component Commander (JFNCC) all will have major interests in controlling the employment of the arsenal ship asset within the theater. Part of this interest lay in the huge capability that arsenal ship provides to each of these component commanders. Another reason is that arsenal ship largely compliments capabilities which already exist.

In essence, arsenal ship is a "dumb" asset. Its eyes, ears and decision making brains are all located elsewhere and controlled from afar. Unlike most naval ships, which are generally tasked by one master at a time, arsenal ship must not only support several joint force component commanders, but also be directly controlled by them all at the same time. It is easily apparent that there will be difficulties and great compromises in weapons coordination, vessel positioning, logistics timing, etc. which will need the attention of the Joint Task Force Commander in order to be resolved.

Consider the issue of positioning the asset within the theater. With such a high volume deep strike capability available

to the operational commander, it is certain that the Joint Forces Air Asset Coordinator (JFAAC) will have a major role to play in deciding how to use the arsenal ship. The potentially hundreds of TLAMs available to fly against deep targets will require close coordination with other air assets just to deconflict airspace, as well as optimize weapons vs. targets. Arsenal ship creates the possibility of relatively large volumes of TLAM clogged airspace during launches of the high numbers of TLAMs envisioned in the very early stages of a regional conflict. Although manageable, it is certainly more of a problem than with operations involving limited numbers of cruiser and destroyer TLAM assets spread out over the naval operating area. JFACC would likely favor stationing the arsenal ship at some distance from other aviation assets, including the aircraft carrier to aid in airspace deconfliction. He could then define a simple "no friendly fly zone" bubble around the ship to provide easy airspace deconfliction. However, this employment factor may not compliment the other missions required of arsenal ship by the remaining interested component commanders. For example, JFNCC would probably be averse to a relatively distant station for the arsenal ship as it would make his job of providing security against the submarine, surface and cruise missile threats more difficult. He would generally see an isolated high value asset as a likely dead one. He would be forced to allocate scarce protective resources (i.e. escort ships) away from his Naval Expeditionary Task Force (NETF). In effect he would be forced to limit the multi-mission roles these escort ships would otherwise

play in order to protect the arsenal ship, all in the name of airspace deconfliction. JFLCC is likely to want the arsenal ship relatively close to shore where its Naval Surface Fire Support (NSFS) umbrella could be pushed inshore to the greatest possible extent. This close in stationing would likely compliment the air defense role of the ship by extending its Navy Area Defense (NAD) BMD umbrella farther ashore as well, but again makes JFLCC's job of coordination and deconfliction more difficult. And in the future, when Navy Theater Wide (NTW) BMD becomes another capability, its required positioning will also conflict with the other arsenal ship missions. This is not to say the problem is insurmountable. Clearly it is not, but the issue is likely to be settled at the operational commander level and is likely to be a compromise of what is best for each component commander.

Another command and control issue is that of the immensely complex and technically intricate data link networks required for the arsenal ship to operate as envisioned. As planned, the arsenal ship will have no sensors, no target designation devices and no fire control ability. In short, it is a blind and stupid pack mule, completely dependent upon off board components for its employment. No single component of this system of sensor and data networks is truly revolutionary or even exceptional in an era of proven data links, C2 networks and complex satellite communications. Remote sensors and cooperative engagements have also been proven valid methods of employment in tests. However, arsenal ship takes these concepts several steps further. It is the



first naval asset completely dependent upon all of these technologies and it is completely lacking in capability without them. In the past, naval and joint forces have used data links to enhance capability, but could have operated, albeit greatly reduced effectiveness, without them. Cooperative engagement has been a theoretically useful concept tested between naval assets for anti-air warfare, but this was merely to enhance an already significant capability held by anti-air capable ships. Arsenal ship, as well as being dependent on outside sources for targeting and information, will also have its weapons launched remotely. This ability is a tremendous boon to the land based commander of troops ashore, who could call for fire support, direct and fire it himself<sup>6</sup>. But it may also pose some problems of its own. In a recent computerized wargame, arsenal ship inadvertently shot down a resupply helicopter hovering over its deck with an ATACM<sup>7</sup>. This virtual reality blind impact accident was the result of a troop commander ashore remotely firing munitions in support of his land forces at the same time the naval component commander was carrying out his logistics mission. These two seemingly unrelated activities would never have conflicted in the past, but will require added C2 consideration in the future provided by arsenal ship.

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<sup>6</sup>Robert Holzer, "Commanders May Share Arsenal Ship Assets," Defense News, 17-23 June 1996, 6.

<sup>7</sup>"Arsenal Ship Raises Command, Budget Questions," BMD Monitor, 7 February 1997, No.3, Vol.12.

Recently, during Fleet Battle Experiment Alfa (FBEA), some of the C2 technologies which will be required for a viable arsenal ship were demonstrated and some of the problems to be overcome were also shown\*. Demonstration of the "sensor to shooter" concept using the Joint Surveillance Targeting Attack Radar System (JSTARS) and the NSFS Weapons Control System Prototype (NWCS-P) to transmit target information directly to the model arsenal ship was successfully conducted. An afloat JFACC integrated the model arsenal ship and the carrier airwing for strike and power projection mission. However, this exercise also brought out some of the C2 problems which will need to be addressed. The difficulty of maintaining the Common Tactical Picture (CTP) required for C2 in the NSFS mission, the above mentioned compromises in C2 relationships between littoral naval commanders and joint forces ashore, and airspace deconfliction were a few of the more notable issues which remain unsolved. However, now that these problems are a reality it is possible to concentrate efforts to solve them. Data management problems are not just an arsenal ship issue and it is clear that similar to the data link systems of the past that there will be service wide growing pains in refining the processes. Super network managers, analogous to a link 11 net control station or a Joint Operational Tactical System (JOTS) Force Track Coordinator (FOTC) will be developed to ensure the information carried on the C2 super networks is sensible and usable by the

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\*Naval War College, Third Fleet Battle Experiment Alfa Quicklook Report, (Newport, RI 3-13 March 1997).

operational commander and his component commanders. The key is that the technology is either present or nearly so to create a hugely synergistic system of information, command and control. What remains is to figure out the best process to take advantage of it.

### OPERATIONAL FIRES

It is in the area of operational fires where the arsenal ship will excel like no ship ever built. Modernized battleships and AEGIS cruisers, with orders of magnitude fewer vertical launch cells available for Tomahawk Land Attack Missiles (TLAM) and more diverse missions to perform, simply do not have anywhere near this capability. Arsenal ship, with potentially hundreds of TLAMS available, will conduct lethal and nonlethal fires in support of the operational commander's plans. This massing of firepower effects is enormously capable of shaping the battlefield before actual hostilities or of halting an advancing force while friendly logistics bridges are activated. It is a greater leap in massed naval firepower than any platform since the aircraft carrier and will likely be as influential in the planning and conduct of major operations ashore. In this respect, the arsenal ship fits the concept of joint warfighting in Major Regional Conflicts (MRC) better than any other naval platform. Having no real capability against opposition naval targets, it is a truly joint naval asset built from the keel up to support land operations.

Unlike the aircraft carrier or ground based attack aircraft, operational fires from the arsenal ship incur inherently less risk

than missions flown by manned aircraft to accomplish similar shaping the battlefield missions. And unlike land based airpower, it does not require any host nation support to provide this capability to the operational commander. It is this competitive aspect of the arsenal ship's ability to accomplish both operational fires and deep strike that has brought Air Force opposition to the program. Why, they ask, should we build a multibillion dollar class of ships that will only compete with strike and operational fires missions with aircraft already bought and paid for? This is a question for force planners and beyond the scope of this paper, but it seems that the answer to this question is obvious. The real issue to be debated is not one of competition for missions or targets between arsenal ship and manned air platforms. The operational issue is how to best use each capability to maximize the effect and efficiency of the other. TLAMs are superb weapons for missions such as destroying bridges and other fixed infrastructures, the destruction of which could greatly isolate the battlefield. It can work well against fixed site command and control targets and relatively stationary or slow moving concentrations of troops. However, hardened targets, highly mobile targets, targets of opportunity which suddenly present themselves, etc. will still require manned aircraft and the unique array of weapons from their arsenals. High Speed Anti-Radiation Missiles (HARM) are without rival in certain Suppression of Enemy Air Defense (SEAD) missions. Air dropped fuel air explosives have been shown to be uniquely capable in both material damage inflicted and

the psychological effects produced on enemy troops. Battle Damage Assessment (BDA) once operational fires have been conducted remains a mission for manned aircraft in most circumstances. The bottom line is that the arsenal ship is uniquely qualified to provide the operational commander with operational fires. It provides a tremendous capability in its own right, but also greatly complements similar type missions by manned aircraft.

#### OPERATIONAL LOGISTICS

Logistically, the arsenal ship presents one of its more significant values to the operational commander, but also one of its most discussed headaches. Able to carry large numbers of vertically launched missiles, it may more than double the available cells to the Joint Task Force Commander over a nominal NETF. In this respect, arsenal ship acts much like the prepositioning ships employed by the Army and Marines. Instead of relying on large logistics resupply of various arsenal ship carried missiles or for other naval assets to arrive from possibly distant operations, the arsenal ship would remain locally available, forward deployed on a permanent basis. However, arsenal ship takes the MPS concept one step further. Rather than just storing and transporting prepositioned assets to warfighters brought in from distant locations, it also carries the means to deliver many of these assets on target. In effect, it will be an ammunition ship (AE) that skips the middleman, by delivering its ordnance to a target

and not to another ship<sup>9</sup>.

By bringing many of the supporting missile assets needed by the operational commander to fight a regional conflict arsenal ship greatly lessens the load on theater logistics operations. In the short term, port facilities, airlift and sealift which would have been devoted to missile resupply will be available for other critical warfighting material. While this may not be as great a help if a conflict becomes protracted it does provide much needed logistics breathing room in the vital early days of a rush to the theater for war.

The issue of how to resupply the arsenal ship itself once it has expended its ordinance would seem to be an achilles heel. Fleet Battle Experiment Alfa, conducted from 3 - 13 March 1997, highlighted this as a major area of concern<sup>10</sup>. Reloading a ship of this size with its relatively huge number of missiles is certainly not a job to be accomplished at sea or at short notice. A secure port facility and considerable time away from the operation will be required and each could present a problem to the operational commander.

However, the problem may not be as difficult or as dire as it would initially seem. There are six arsenal ships planned. That force structure should support the availability of a second asset

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<sup>9</sup>CAPT Charles Hamilton, USN, Joint Arsenal Ship Program Office, "Arsenal Ship Briefing," U.S. Naval War College, Newport RI, 25 March 1997.

<sup>10</sup>Naval War College, Third Fleet Battle Experiment Alfa Quicklook Report, (Newport, RI 3-13 March 1997).

to arrive in theater to relieve the first for reload. Will this always be the case? Of course not, but it must be remembered that arsenal ship is not the only arrow in the CJTF's quiver of naval assets. If it is required that cruisers and destroyers are the only vertical launch assets on station for a time, then so be it. It remains a planning issue that perhaps arsenal ship's weapons be the first expended, if possible, and that the more limited numbers of missiles onboard other ships be saved to cover the period of time when arsenal ship must depart to reload or another can arrive.

Another way to minimize this problem is to carefully consider arsenal ship notional loadouts. Missile mix should be tailored by theater to suit both the terrain, the likely enemy and the operational plan. In an operational area such as the Gulf, it would make sense to heavily bias the loadout with TLAM and SM-2 (BLK IVA), with less emphasis on ATACM and ERGM. This would recognize the limited geography of the Gulf and arsenal ship's likely distance from the battlefield. However, it would enhance the ship's capability for operational fires and operations security by emphasizing the deep strike and BMD ordnance. With more of these types of ordnance onboard, it would be longer into the operational timeline before departure for resupply would be required. The Korean scenario would have a different emphasis, specifically ATACM and SM-2 (BLK IVA). The NSFS and BMD missions in this theater take on greater importance due to the sheer size and type of the enemy army, and also the number of ballistic missiles to be faced by the Commander Joint Task Force. By

tailoring the arsenal ship loadout to match the theater, this assets value to the operational commander can be focussed on the greatest need and also stretched logistically.

The logistics bottom line is that probably too much has been made of the resupply issue with regard to arsenal ship. Clearly, it will have to be resupplied in any protracted conflict, but that is true of any asset which carries similar ordnance. This logistics need for a secure port should not be viewed as a negative aspect particular to the arsenal ship. Certainly, it is a logistical planning issue whose timing must be fit to the immediacy of the threat, availability of replacements and estimated time for resupply. The key is that the negative effects can be minimized by sound operational level logistics planning.

#### EMPLOYMENT VISION

By maintaining a permanently deployed presence in a theater arsenal ship will make assets almost immediately available to the theater CINC. In fact, many who are considering its employment envision the arsenal ship being stationed and maintained alongside the other prepositioning ships of the major theaters in peacetime. It is true that this does not allow the arsenal ship to be available instantly for fire missions whenever the operational commander desires. However, for several reasons this appears to be a practical approach.

First, by backing away even slightly from the immediate high security threat area, such as the Gulf, the chances for terrorist or opportunist naval attack are greatly reduced. Also reduced is



the need to divert other naval assets from their normal peacetime missions to provide security at a time when arsenal ship's capabilities are not immediately needed.

Secondly, by stationing arsenal ship only a few days away from the immediate area of interest, its psychological and deterrent impact will be all the greater when it does arrive on station. An aircraft carrier battle group steaming from the Mediterranean Sea to the northern Gulf deterred Iraq once a major force buildup had been detected in southern Iraq in 1995. The strong signal of a force arriving on scene as a response to a threat had great deterrent effect. An arsenal ship only days away in Diego Garcia would have much the same effect as it rushed to the Gulf when American interests are threatened. It would certainly send a serious signal of intent. Surface warships, already a considerable presence in the Gulf, would provide necessary security until other forces appropriate to the particular situation could arrive. The nominally five or so warships consistently deployed to the Gulf would form an adequate anti-air, surface and subsurface protection force while the arsenal ship provided plenty of offensive punch to deter or temporarily halt ground force threats to national interests. This is not to advocate an ASBG (Arsenal Ship Battle Group). Surely that would have operational limitations too great for going it alone in many circumstances. But for bringing force quickly to bear, and then greatly complimenting other joint forces once they arrive, it is difficult to argue with the utility of this employment concept.

## RECOMMENDATIONS/CONCLUSION

It is clear that the arsenal ship concept is unique, but also that it is still in its embryonic phase. It appears that the vessel will be built and soon. However, the technology which will enable the platform to reach the potential envisioned for it is still developing and may not be mature by the time the first arsenal ship enters the force. With this in mind, the following recommendations are made:

First, it is recommended that nominal missile loadouts be considered for each likely theater of employment. Any theater which contains a ballistic missile threat places a requirement for a significant number of available launch cells to be devoted to SM-2 (BLK IVA) missiles. Further, theaters such as the Gulf which are likely to favor airpower in a regional conflict should bias the arsenal ship loadout toward TLAM. These deep strike weapons would be used to attack critical Integrated Air Defense System (IADS) nodes and reduce the risk manned aircraft in later assaults. This concept doubly applies to isolated theaters where political and environmental conditions do not allow for a large number of friendly troops to be present before the conflict begins. In this instance, TLAM would be used as a halting weapon to stall the advance of enemy columns while troops and prepositioned material could be matched for a fuller defense. The Gulf operating area would be such a theater where TLAM biased loadouts should be the norm for arsenal ship.

Conversely, in a theater such as Korea, where the area is more

restricted and operations are likely to be more troop emphasized, the arsenal ship loadout should favor ATACMs and vertical gun installations. Repositioning the arsenal ship as friendly troops advance (or retreat) these weapons would provide near instantaneous shore fire support in any area of the peninsula. Simultaneously, the protective TMD umbrella would also move to cover operations on the ground.

Next, consider and develop theater specific employment doctrine now, using the capability of the arsenal ship that will be in place when the first ship is delivered. This must include the operational functions which the ship can already carry out when built, such as operational fires (TLAM) and some operational security measures (TMD). Other functions which will require a more developed technology (NSFS-type OPSEC, fully networked TMD, fully integrated sensor to shooter C2, etc.) can be incorporated later. This present doctrine should center around joint control of the arsenal ship asset mainly for positioning within the theater of operations, logistics matters and airspace deconfliction. That basic doctrinal framework can be refined once relevant technologies are developed, but the basic issues are unlikely to change. However, the arsenal ship operational doctrine will expand and develop include procedures for control of specific weapons employment, C2 network hierarchies and procedures, etc. The bottom line is that operational commanders must think now about how they will incorporate the arsenal ship into their joint warfighting infrastructures. The concept must be experimented with in future

Fleet Battle Experiments and also joint exercises such as "Roving Sands 95"<sup>11</sup>.

In summary, it seems clear that arsenal ship is quickly coming to the fleet, or more importantly, to the operational commander.

Just as clear is the fact that, although it remains a challenge to engineers, many of the technological issues will also be resolved reasonably soon. What remains is for meaningful planning to be conducted which will fully integrate arsenal ship into the joint task forces of the near future. Third Fleet Battle Experiment Alfa was a good start which demonstrated the doctrinal challenges which lay ahead in both C2 and logistics arenas. It is time now for continued exercises which test possible solutions. To wait until arsenal ship is already a fleet asset will be to waste its potential.

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<sup>11</sup>LCDR Charles C. Swicker, "Ballistic Missile Defense From the Sea: The Commander's Perspective," Naval War College Review, Spring 1997, 7.

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